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Systematic Review of Family Nurse Practitioner Utilization Within School Environments

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Walden University

College of Health Sciences

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Luz Elena Zapien

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Walden University
2020

Abstract

Systematic Review of Family Nurse Practitioner Utilization Within School Environments

by

Luz Elena Zapien

MSN, Walden University, 2017

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

August 2020

Abstract

The American Academy of Pediatrics and the Institute of Medicine recommend school health screening programs to detect problems that might interfere with a student's education and general well-being, and many U.S. states require compliance with enrollment requirements such as updated immunizations and physical exams prior to attendance. In low-income areas, however, there is often a shortage of physicians available to meet the healthcare needs of the population. Family nurse practitioners (FNPs) can be utilized in school health settings to deliver health care services that support school attendance and the well-being of school students, yet little is known about their impact. The purpose of this systematic review of the literature was to understand the current evidence supporting FNP utilization within school environments. Nola Pender's health promotion model informed the design of this project. The revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) was used to guide the review of identified literature. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to document the included studies while Melnyk and Fineout-Overholt's levels of evidence was used to grade the evidence. Only 6 journal articles met the project's inclusion requirements. These articles described the positive impact of FNPs on the health and social determinants of health for the school population. The DNP project supports social change by highlighting how FNPs within school environments can meet the medical needs of underserved populations by providing up-to-date medical services such as vaccines and physical exams on a routine basis.

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Dedication

I wish to dedicate this lifetime achievement to my mother, Manuela Marquez, who always encouraged me to dream. Also, to my husband, Victor Zapien, who gave me wings to pursue those dreams and make them a reality.

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Section 1: Nature of the Problem

Introduction

Advanced practice nurses (APNs) are emerging in many different areas of health care. The nursing profession is ever-changing and evolving, similar to the manner of meeting the health needs of diverse populations. Little is known about the health outcome effects on school children by FNPs working in educational systems. The cost savings and ability to reach marginalized communities while providing quality care validates the APN role. Fund and Swanson-Hill (2014) found that the quality of care between physicians and APNs does not differ while the cost savings are significant at 15 to 1.

Problem Statement

In a school district known for violence, there are approximately 40,000 students with 82% at the poverty level (Schoolwires, Inc., 2019). The school district is located in a medically underserved city mentioned by UC Health (2018) to be one of the fastest-growing, poorest, and least healthy regions of the state. There has been a long-standing shortage of physicians and other health care professionals available to meet the needs of the population. This shortage provides a compelling rationale for investigating how family nurse practitioners (FNPs) can be utilized in school health settings in the district. Page & Campbell (2014) highlighted an FNPs collaborative work to reduce obesity in children. FNPs have the potential to deliver health care that is well planned and aligned with the needs of the community.

Children lose days in school when not permitted to attend for lack of compliance with enrollment requirements such as updated immunizations and physical exams. Organizations such as the American Academy of Pediatrics and the Institute of Medicine's Committee on Prevention of Obesity in Children and Youth recommend school health screening programs to detect problems that might interfere with students' education and general well-being (Brassard, 2013). Obstacles to school entry such as not having all required immunizations could easily be satisfied by the presence of an FNP in the registration office. Rogers (2019) mentioned a lack of access as a barrier to immunization compliance (p. 2). However, not many school districts in the state utilize FNPs in their health services departments (UC Health, 2018).

A gap in nursing practice exists because the school district is not fully aware of the impact of FNPs in school health services departments. FNPs working in educational environments that practice to their full scope of education have the ability to affect and manage children's health suffering from asthma, diabetes, and many other chronic conditions. Mattheus, Shannon, Gandhi & Lim (2018) stated that children with caries may suffer from pain, failure to thrive, poor school performance, and diminished quality of life (p. 357). I conducted a systematic review of the literature to identify strategies for effectively implementing FNP school health services programs that improve the health outcomes of students.

Purpose

The purpose of this project was to review the literature available regarding the utilization of FNPs in school environments. The practice question was, What is the current evidence supporting FNP utilization within school environments? Exploring evidence on successfully implemented programs may clarify what information is needed and/or demonstrate areas requiring further exploration. Although the Affordable Care Act increased access to health insurance coverage (Jarlenski, Baller, Borrero, & Bennett, 2016), there is still a significant number of children who for multiple reasons are not registered for a health plan or medical home ((Jarlenski, Baller, Borrero, & Bennett, 2016). For instance, in 2016, children in immigrant families were 24% of the child population in the United States and represented 42% of uninsured children (Jarlenski et al., 2016). FNPs in the school environment can ameliorate this situation and positively affect the well-being of marginalized children within school environments.

Nature of the Doctoral Project

The nature of the doctoral project was a systematic literature review. In conducting the project, I followed the guidelines set forth in Walden University's *DNP Manual for Systematic Review*. The sources of evidence were from peer-reviewed, English language articles with publication dates ranging from 2013 to 2019. The Walden University Library online databases accessed were Academic Search Complete, Journals @ OVID, Expanded Academic ASAP, CINAHL Plus with Full Text, ScienceDirect, Business Source Complete, SocINDEX with Full Text, and Cochrane Systematic Reviews. The search terms included were *nurse*

practitioner in K-12 grade schools, uninsured children in the United States, school nursing, and underserved populations. The Boolean strings *and/or* were used to obtain a more comprehensive search, as well as citation chaining. The revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0; SQUIRE, 2014) was used to review the identified literature. I used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; PRISMA, 2015) flow diagram, included as Appendix A, to document the included studies. Melnyk and Fineout-Overholt's (2019) levels of evidence hierarchy was used to determine the levels of evidence for each study and is included as Appendix B. The results are presented in a Summary of Evidence table included as Appendix C.

Significance

Across the United States, there are areas that are medically underserved, and local agencies are scrambling to create programs that are cost-effective and far-reaching. Schroeder, Malone, McCabe, and Lipman (2018) described social determinants of health that are a major challenge and an essential part of the role of the school nurse (p. 184). The World Health Organization (WHO) defines social determinants of health as the conditions in which people are born, grow, work, live, and age, along with the wider set of forces and systems shaping the conditions of daily life (WHO, 2019). FNP's practicing as school nurses have easy access to children who face barriers obtaining traditional healthcare, have a greater understanding of family needs and priorities, and can advocate for issues that impact the child's well-being (Schroeder et al., 2018). Thus,

school nurses are critical participants involved in system-level implementation of school programs related to health promotion (McIsaac, Hernandez, Kirk, & Curran, 2016).

Although FNPs can meet the needs of many school children, including those who frequent emergency rooms for lack of a medical home. Gregg, Chen, Kim, Tak, & Tibbits (2019) stated that in “1967 the American Academy of Pediatrics (AAP) used the term to describe a physical location of a child’s complete medical record. In 2002, the AAP expanded their definition of a medical home to a service model for both pediatric and adult populations that provides accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective care (p. 189). Similarly, there are in-school dental programs that serve as students’ dental homes (Simmer-Beck et al., 2014). Unfortunately, FNPs in certain states cannot practice independently due to legislative constraints. This gap in practice in the identified underserved area is how children may benefit from FNP services within all district schools. The ability of children to receive up-to-date medical services such as vaccines on a routine basis may promote positive social change for these children, their families, and West Coast communities.

Summary

In Section 1, I introduced the gap in practice related to a lack of health services for school-age children and the importance of FNPs in filling this gap. Evidence demonstrates that school health services are important to healthy children and communities (McCrory, Bozalis, Crutcher, 2014). The practice question was, What is the current utilization of evidence supporting FNP utilization within school environments? In

Section 2, I will discuss Nola Pender's (2011) health promotion model, the literature relevant to this project, the local background and context, and my role in the project development and implementation.

Section 2: Background and Context

Introduction

There is a lack of physicians and other health care professionals to meet the needs of the population, and especially school children, in the United States. How to best aid medically underserved populations provides a persuasive rationale for investigating how FNPs can be utilized in school health settings. The purpose of this doctoral project was to review the literature available regarding the utilization of FNPs in school environments. In Section 2, I describe concepts, models, and theories that address the practice question and consider how they relate to nursing practice.

Concepts, Models, and Theories

Nola Pender first created the model of health promotion in 1982 with the latest revision in 2002. The model assumes that individuals actively seek to regulate their own behavior and health professionals can influence individuals throughout the life span to participate in behavior changes to promote health (Gonzalo, 2011). The model has three major categories: (a) behavioral characteristics and experiences, (b) behavior specific conditions and effects, and (c) behavior outcomes (Gonzalo, 2011). Figure 1 depicts the specific behaviors associated with each category. The proposition that families, peers, and healthcare providers are important sources of interpersonal influence is very important to school nursing programs and the health promotion of school age children (Gonzalo, 2011).

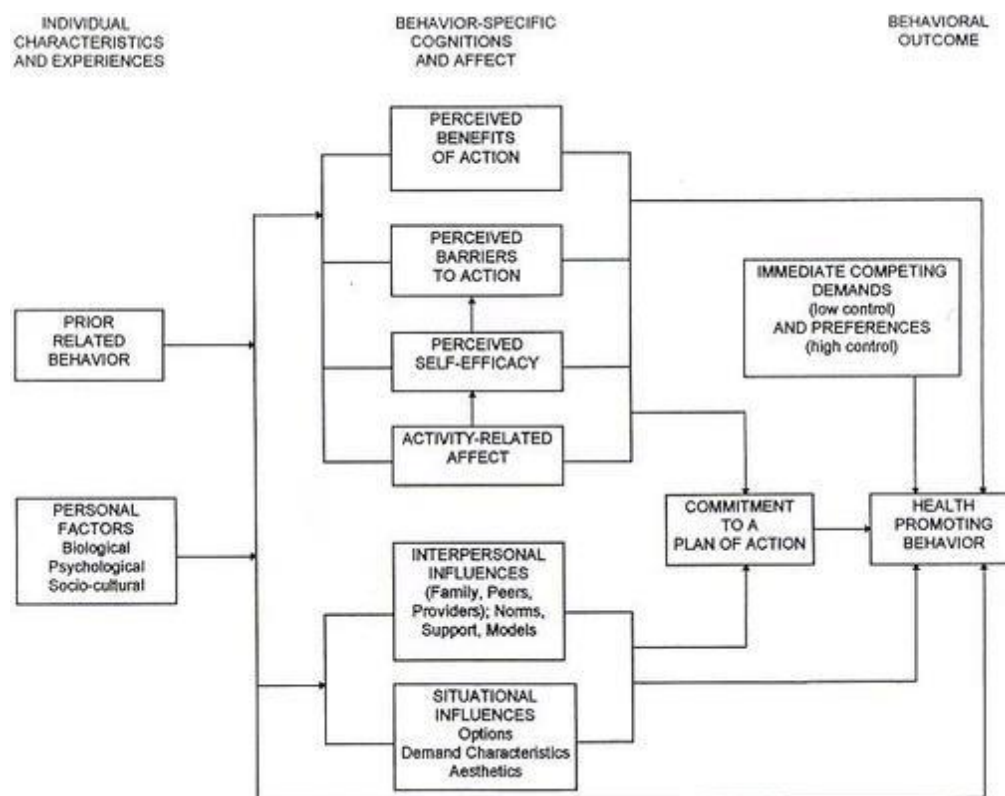


Figure 1. Pender model of health promotion. From “Salem Press Biographical Encyclopedia,” by B. Lightner, 2018. Retrieved from Research Starters – Education database. (128881327) Copyright © Grey House Publishing, Inc. 2018 [year] by Name of Copyright Holder. Reprinted [or Adapted] with permission.

Relevance to Nursing Practice

Strolin-Goltzman et al. (2014) stated that there are approximately 2,000 school-based clinics in the United States with documented increased access to care (p. 83). At the time of writing, the school district involved in this project had a student population of 40,000 students in 54 schools. There are only three school-based clinics run by outside medical agencies. The medical providers serve the 3,780 students from those particular high schools. Consequently, 36,210 students do not have access to services provided by the three clinics.

Local Background and Context

Until 2 years ago, the public health department would conduct immunization clinics within the school district and give children who did not have insurance or a medical home the needed vaccinations or health evaluations. Currently, the public health department has its own clinic to see children, who are required to commit to the clinic as their medical home to receive services. Consequently, children without medical coverage or transportation to those clinics are left medically neglected. FNPs within the school environment often serve as the child's only medical contact through school health programs. FNPs can administer immunizations, conduct health evaluations, treat minor conditions, and monitor chronic conditions (Strolin-Goltzman, Sisselman, Melekis, & Auerbach, 2014).

An FNP hired by the school district health services department could rotate between schools and provide a myriad of services to the underserved population. This systematic review served to answer the following practice question: What is the current evidence supporting FNP utilization within school environments? I will present this information to the school board administration in support of FNP utilization to improve healthcare for underserved children.

Role of the DNP Student

As a school nurse for the past 22 years, I have encountered many situations in which conducting a physical exam or giving an immunization could have kept a child in school instead of being absent to satisfy the school admission mandate. Also, many minor illnesses such as ear infections or head lice can easily be assessed and prescribed

an antibiotic or appropriate medication that is sent to a child's pharmacy for pickup by the parents, all while the student maintains attendance in school. The practicum experience associated with this DNP program presented an opportunity to establish roles, functions, and guidelines for practice.

I plan to present this doctoral project to the health services manager and school board in the project district. The purpose is to highlight the importance of the FNP role within the school environment with the hope that other school districts will notice the value and importance of such change and investment. Some states still require a physician to supervise the nurse practitioner, and depending on the area of the United States, the authorization for FNPs to practice to their full licensure may be somewhat more difficult and frustrating. Phillips (2018) highlighted that while in California the "reimbursement of FNPs is 100% that of a physician, NPs function under "standardized procedures" or protocols when performing medical functions, collaboratively developed and approved by the NP, physician, and administration in the organized healthcare facility in which they work" (p. 35).

Summary

In Section 2, I presented the concepts, models, and theories utilized in the justification and application of the project. The Nola Pender health promotion model was highlighted, and its relevance to nursing practice was reflected in the literature review. I also described and applied the local background and institutional context to the problem being addressed. In addition, the role of the DNP student was explained along with possible challenges presented. In Section 3, I describe the collection and analysis of

project evidence. The sources of evidence are listed and related to the practice-focused question.

Section 3: Collection and Analysis of Evidence

Introduction

A shortage of physicians and other health care professionals to meet the needs of underserved populations provides a compelling rationale for investigating how FNPs can be utilized in school health settings. FNPs have the capacity and training to deliver health care that is well planned and aligned with the needs of the community (Fund & Swanson-Hill, 2014). The purpose of this project was to review the literature available regarding the utilization of FNPs in school environments. In the project district, children are excluded from school when they are not compliant with enrollment requirements such as updated immunizations and physical exams. Obstacles such as these could be addressed by having an FNP in the registration or health office. An FNP has the qualifications and training to order and administer immunizations and physical exams. In Section 3, I describe the sources of evidence for this doctoral project and discuss how the evidence was analyzed and synthesized. I also restate the practice-focused question.

Practice-Focused Question

In analyzing the literature, I focused on the current evidence related to school health and the use of advanced practice health care providers in the school health setting. The practice-focused question was, What is the current evidence supporting FNP utilization within school environments?

Sources of Evidence

The sources of evidence reviewed were from peer-reviewed English language articles published between 2013 and 2019. The Walden University

Library online databases accessed included Academic Search Complete, Journals @ OVID, Expanded Academic ASAP, CINAHL Plus with Full Text, ScienceDirect, Business Source Complete, SocINDEX with Full Text, Joanna Briggs Institute EBP Database, and Cochrane Systematic Reviews. The search terms used were *nurse practitioner in K-12 grade schools*, *uninsured children in the United States*, *school nursing*, and *underserved populations*. I also used the Boolean strings *and/or* and citation chaining to perform a more comprehensive search. The inclusion criteria were articles from 2013-2019, written in English, and published in peer-reviewed journals. Other sources of evidence included position statements by the National Association of School Nurses, the California School Nurses Association, the National Association of Pediatric Nurse Practitioners, and the California Board of Registered Nursing. These sources elucidate past and current utilization of FNPs within school environments as well as legislative constraints and privileges. Exclusion criteria matched those specified in the Walden University DNP Manual for Systematic Review (2019) and are listed as follows:

- Internal site records
- Questions posed via questionnaires, interviews, focus groups, or any other method
- Filming of events to observe behaviors, study environments and processes, or capture products and/or outcomes
- Collection of observational data (p. 12)

Protections

I obtained approval (no. 08-16-19-0603416) from Walden University's Institutional Review Board prior to implementation of this systematic review.

Analysis and Synthesis

I used the revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) to review the identified literature (SQUIRE, 2014). A PRISMA flow chart (2015), included as Appendix A, was utilized to describe the selection of articles included in the systematic review. Melnyk and Fineout-Overholt's (2019) levels of evidence hierarchy was used to determine the levels of evidence for each study and is included as Appendix B. I reviewed the literature to assess whether the evidence addressed the project question and, in so doing, identified strengths, weaknesses, and gaps in the existing literature. The reviewed literature was assembled in a Summary of Evidence Table included as Appendix C. From this completed review, I developed recommendations related to the practice problem that I will present to the organization stakeholders.

Summary

The practice-focused question was, What is the current evidence supporting FNP utilization within school environments? In Section 3, I described the collection and review of evidence and the method for tracking and analyzing the evidence. Section 4 will include the findings and recommendations.

Section 4: Findings and Recommendations

Introduction

In a medically underserved area, there are children who suffer delayed entrance into school due to lack of updated immunizations or physical examinations. In this systematic literature review, I explored how FNPs have been utilized within school health settings to provide healthcare to children. FNPs are integral partners of the school district health department and can provide a myriad of services that meet the needs of children without health coverage. For example, they can administer immunizations as part of the school enrollment process.

To find literature, I searched the following databases: journals @ OVID, CINAHL Plus with Full Text, ProQuest, Expanded Academic ASAP, Nursing and Allied Health, Science Direct, Business Source Complete, SocINDEX with Full Text, Joanna Briggs Institute EBP Database, Cochrane Systematic Reviews, and Embase. Key words used were *nurse practitioner in K-12 grade schools*, *uninsured children in the United States*, *school nursing*, and *underserved populations*. I used the Boolean strings *and/or* to obtain a more comprehensive search as well as citation chaining.

I organized search results into several categories as follows:

- Advanced practice registered nurse (APRN) program: Two articles included discussion of the need for developing programs that produced APRNs who service underserved populations and work in college campuses.
- Barriers to care: 26 articles addressed the many social determinants of health and immunization programs, but none addressed the use of NPs in schools.

- Immunizations: 29 articles addressed immunization programs within schools with a concentration on influenza programs. The National Association of Pediatric Advanced Practice recommended that NPs should take initiative in establishing programs to support vaccine programs although not specifically indicating a particular program (National Association of Pediatric Nurse Practitioners, 2015).
- Legislative: Four articles addressed the advances in preserving FNP authoritative and legislative rights in several states. None addressed the expanding role of NPs within school environments.
- Medical: Three articles addressed providing preventive services to reduce ER visits, though two of the articles did not expand on who would provide the services. One article highlighted the need for medical students to train in medically underserved communities.
- NPs: Eight articles addressed the evolving role of NPs with successes and challenges mentioned. None mentioned working in the school environment although new areas of practice were mentioned, such as NPs as hospitalists. The consensus was that NPs provide high quality care with cost savings.
- Professional associations: One article addressed the importance and benefits of professional association membership. The authors of this article mentioned the Association of School Nutrition but did not mention NPs working in school districts (Ki & Wang, 2016).

- School health models: 28 articles addressed different ways to set up school health clinics and funding sources. Most addressed the utilization of RNs and some NPs as collaborators from outside agencies.
- Theories: The authors of two articles gave examples of theories that can be used to address health issues, in particular, the multitheory model of health behavior change utilized for adolescents who smoke or use illegal drugs (Sleet, Branscum, & Knowlden, 2017).). Theories discussed were used primarily in college health settings with some implications for high school students. Neither author mentioned use of these theories by NPs in schools, but their use appears to be very appropriate to me.
- NPs in school: Six of the articles listed in Appendix C fall in this category. One addressed providing care to underserved populations and preparing NPs educationally to meet the challenge (Creech, Paulson, Andrews, & Cooper, 2018). Additionally, another article highlighted the influx of NPs in hospitals and clinics with the care coordination undertaken with community resources such as school systems (Grant, Lines, Darbyshire, & Parry, 2017). One addressed the expanding role of public health nurses but did not mention how NP status could facilitate the role and its application in school environments (Gahunia, Bigham, Konrad, & Snow, 2013). The author of another article endorsed the Affordable Care Act as an opportunity for NPs to serve those most in need and mentioned how an APN could do scoliosis checks in the school and manage that condition as well as other chronic conditions before

becoming emergencies(Platform for improving care, 2012) Literature reviews were encouraged by Cowell (2015) as a means of incorporating evidence-based practice by clinicians in schools , implying a new focus for healthcare providers. Finally, the author of one article discussed the importance of having a school-based clinic and the collaboration of the Cincinnati school district with a federally qualified health center in funding and supporting NPs' work in such clinics (Sprigg, Wolgin, Chubinski, & Keller, 2017)

Findings and Implications

The tedious work of screening 8,513 articles for their applicability to describing how NPs are working within school districts was discouraging. This number of articles was broad to support my interest in providing a comprehensive review of literature. Only one article was a literature review of articles from around the world (Grant, Lines, Darbyshire, & Parry, 2017). Unfortunately, citation chaining did not help as all the articles included in the identified literature were written before 2013. Several articles implied the need for further education to embrace expanding nursing roles and the current deficits in the education of NPs to include community settings such as school nursing (Grant, Lines, Darbyshire, & Parry, 2017). The number of articles reviewed after duplicates were removed was 139. After final analysis, six articles met the inclusion criteria of full-text articles addressing the role of FNPs in school environments.

A few articles included in the final analysis are editorials and case reports that score low on the levels of evidence, although they describe the potential positive effects that NPs working in school districts could have on the social determinants of health

(Creech, Paulson, Andrews, & Cooper, 2018) (Sprigg, Wolgin, Chubinski, & Keller, 2017). I found the case report by Sprigg, Wogin, Chubinski, and Keller (2017) to be an excellent resource for setting up a sustainable school-based health center. The authors mention how many and what types of visits an NP should have to sustain the clinic. Furthermore, they recommended having FNPs for flexibility in caring for the entire family and not just pediatric nurse practitioners.

Child Health and Disability Prevention physicals are not required until first grade. Consequently, a kindergarten round-up in a school district in the western United States produced 80 out of 100 children who did not have a physical exam in the previous year. Receiving up-to-date medical services such as an annual physical exam can help health providers detect early signs of illness and may improve health outcomes for these children (Maurer, Warren, & Pohl, 2016).

Recommendations

Because regulators on the West Coast still do not allow an FNP to practice to the full scope of education and training independently, it is recommended that FNPs collaborate and function under established health centers while providing services to children in school district health centers. Federally qualified health clinics provide the best opportunity for the sustainability of school district health centers. Many federally qualified health organizations have FNPs in their workforce and therefore already have guidelines, protocols, and standards (Sprigg, Wolgin, Chubinski, & Keller, 2017). Consequently, the established clinics offer resources that can be used by FNPs working in satellite clinics within school districts.

Strengths and Limitations of the Project

The strength of the Doctoral project is that in communicating the study to stakeholders, it has materialized into a new hybrid FNP position. The position will be financed by a local medical association while located on the grounds of a school district central registration area. Currently, only one FNP is trained for the position, although it opens the door for more FNPs to follow. Conversely, the limitations of the project was the novelty. Since the project is a first for both agencies, there is little history of such an association. Also, through an exhaustive search, there is no literature available describing an exact agency agreement.

Section 5: Dissemination Plan

Introduction

The ultimate purpose of any DNP project is to improve patient care outcomes. No matter the tool utilized, such as a teaching segment to nurses or a review of literature, the experience and knowledge gained may positively affect the patient and society in general (Walden University, 2019). Advanced practice nurses have a responsibility to share knowledge and insights gained from scholarly work. In previous sections, I described the project I undertook to address the practice gap. In this section, I will explain my plans for disseminating the information gained from conducting this project.

I began to contemplate practice issues for a potential DNP project several years ago when answering curious questions from coworkers and department managers. The old nursing adage of “if it is not written, it didn't happen” was applicable in this situation, and thus I began to write about my project ideas. Surely, there are people like myself in other school districts who have asked themselves the same questions and who have searched the literature with frustrating results. In my opinion, if the publishing of experiences does not occur, the professional development of nursing stagnates. It is imperative that documentation occur regarding stakeholders and FNPs business associations and agreements. In detailing the DNP project, literature is increased and made available for future DNP projects.

Target populations for the dissemination of findings include advanced practice nursing journals, school nursing journals, and educational management journals. I will distribute the project findings to the school district health services manager and school

directors for the project district. Also, the medical and nursing director from a local federally qualified health system will receive a copy.

Analysis of Self

It has been a long-time dream of mine to pursue an advanced practice degree focused on the school environment. Fortunately, the health services manager at my institution has held progressive views and appreciates the positive effects that advanced degrees obtained by staff can have on the department. Due to the research and DNP project exploration, I have experienced increased confidence in undertaking unknown subjects. The application of research skills learned as well as the practice of critical thinking skills has facilitated mastery of subject matter that I plan to use in providing training or consultative services to others.

Summary

In reviewing the literature, I found scant literature concerning the utilization of FNPs in school environments. Because of state licensing constraints, school districts in the United States are not able to directly hire NPs, and those who are affiliated with schools are located in health centers run by outside agencies. In essence, an advanced practice position in school environments does not yet exist.

Findings from this project establish the need for an FNP within the school environment. I recently received the opportunity to function as an FNP in a hybrid position within the school environment. This will be a first for this school district as well as for the funding organization. A major federally qualified health system is undertaking the financial backing and clinic setup at the school district Central

Registration location. Any child registering for any grade or school within the district must first visit the Central Registration office for documentation and health clearance. Only then are they cleared for school entry. My role is specifically to conduct physical exams and provide immunizations for school entry. Any chronic condition or other health concerns will be siphoned to one of the affiliated area clinics. All children having Medicaid and without medical homes will be assigned a clinic. Children who do not have insurance will still be seen and appointed a medical home. A daily journal of what goes right and what needs improvement will assist with program planning and future dissemination of results as a follow-up to this project. Having an FNP at a school district Central Registration office is the closest, for now, to an advanced practice independent practice within an educational setting. Talking about and planning this DNP project made it come alive and become a reality even before the write-up was completed. My hope is that dissemination of project findings will galvanize change in the local district that improves the health outcomes for the many students it serves.

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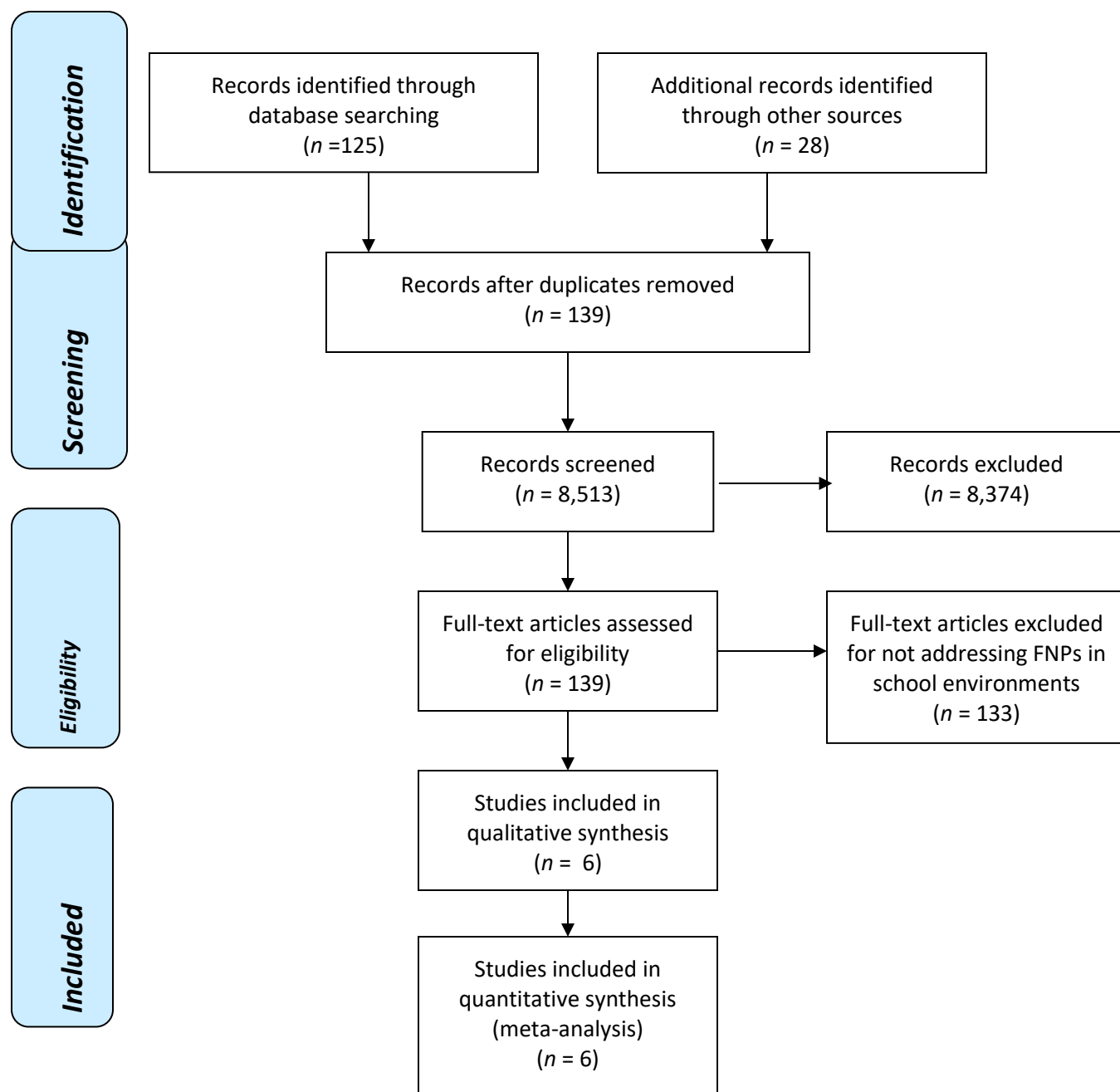
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Appendix A: PRISMA Flowchart



Adapted from “The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration,” by A. Liberati et al., 2009, *Annals of Internal Medicine*, 151(4). CC BY 4.0.

Appendix B: Melnyk and Fineout-Overholt Levels of Evidence Hierarchy

Hierarchy of Evidence for Intervention/Treatment Questions

Level I – Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials

Level II – Evidence obtained from well-designed randomized controlled trials

Level III – Evidence obtained from well-designed controlled trials without randomization

Level IV – Evidence from well-designed case-control and cohort studies

Level V – Evidence from systematic reviews of descriptive and qualitative studies

Level VI – Evidence from single descriptive or qualitative studies

Level VII – Evidence from the opinion of authorities and/or reports of expert committees

From *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (p. 18), by B. M. Melnyk and E. Fineout-Overholt, 2019, Philadelphia, PA: Wolters Kluwer. Copyright [2019] by Wolters Kluwer. Reprinted with permission.

Appendix C: Summary of Evidence Table

Citation							
Problem description	Aim of the study, setting, and sample	Study design and intervention	Findings/ Results	Limitations	Conclusions	Level of evidence	Analysis of relevant study
Academic Partnerships: Preparing Nurse Practitioners for Underserved Populations, Creech, C., Paulson, J., Andrews, M., Cooper, D. (2018)							
Medically underserved populations suffer disproportionately from disease and poor health.	Describes the process of establishing academic partnerships for NP clinical training in underserved sectors	A descriptive study	NP educational programs should create learning modules tailored in teaching NPs regarding underserved populations	Focused only on one program	Developing academic partnerships with designated preceptorship and student learning modules that are tailored to a specific population increase NPs abilities in serving underserved populations.	6	Stated that NP's needed more exposure to underserved populations and mentioned HIV patients but did not mention school systems
Adverse Events Following Immunization: Evaluating an Enhanced Nursing Role for PHNs, Gahunia, J. (2013)							
Previously only medical health providers provided evaluation of immunization adverse events and provided recommendations for re-immunizations.	Canadian Fraser Health system tested a new program where public health nurses obtained additional training to expand their role and also evaluate immunization adverse events and provide recommendations for re-immunizations.	A quantitative analysis of turnaround time comparing medical health providers and public health nurses	There was no significant difference in report and recommendation turnaround time between the medical health provider and public health nurses.	Eluded to a new advanced practice role but did not specify or directly state that it should be a nurse practitioner role.	A new role for public health nurses is recommended.	6	Immunization administration and surveillance are an important role for NPs in the school environment, unfortunately, this article did not reach that far.
How do nurse practitioners work in primary health care settings? A scoping review author, and date of publication, Grant, J., Lines, L., Dargyshire, P., Parry, Y. (2018)							
The review was prompted by a need to examine the evidence base from which to trial implementation of a nurse practitioner led multidisciplinary care team into a homeless service to provide health and care to vulnerable children and families in South Australia.	74 articles from developed countries that reported on how nurse practitioners provide primary health care in community settings. The majority of papers were from the United States of America (n = 45), Canada (n = 12) and the Netherlands (n = 9). A smaller number were	A scoping literature review exploring models used by nurse practitioners to provide care to vulnerable children in community settings including school nursing	Nurse practitioners provide care in a range of accessible settings such as primary care centers (n=42), community centers (n=6), homes (N=5), schools (N=3), child abuse clinics (n=1), via communication technologies (n=6), and through	Only three NPs that work in schools were included in the study.	When NPs are allowed to practice to their full potential, it is noted that they have enhanced skills and are able to improve the health outcomes of individuals and groups. Observed community benefits are increased	1	Demonstrated the evolving roles of NPs including school nursing. Highlighted the broad range of positive effects on health improvement in underserved populations while addressing the social

	based in the United Kingdom (n = 3), Australia (n = 2), Guam (n = 1), New Zealand (n = 1), and Slovenia (n = 1)		combined face-to-face and communication technologies (n=5). Throughout NPs functions it was noted that they affect the medical needs and also the broader social determinants of health for vulnerable populations.		access to care by NPs as well as increased quality of care. Societal benefits as a cost savings is noted.		determinants of health.
Platform for Improving Care, Patton, R.M. (2012)							
The Affordable Care Act (ACA) has a strong “anti-movement” from the media. Nurses owe it to their patients to take time to become informed.	An editorial by legislative nurse that has served in many high influential positions such as co-chair of the Robert Wood Johnson and Institute of Medicine’s Future of Nursing’s Initiative and president of the American Nurses Association.	An editorial recommending that NP’s practice to the full extent of their license and education.	The ACA overhaul has provided expansion of services to include preventive and early screening services. This opens up the cost-effectiveness NP role	An editorial without any data analysis	Author states this is the time of Nursing’s Golden Age since NP roles are expanding and APRN utilization will become the norm for primary care.	6	Although article is an editorial, the source is very reliable and mentions NP’s running independent clinics in schools that address life-crippling conditions such as scoliosis before they become problematic.
School-Based Health Centers: A Funder's View Of Effective Grant Making, Sprigg, S. M., Wolgin, F., Chubinski, J., & Keller, K. (2017)							
Unhealthy children have poor school performance. There is a lack of access to health care in school systems.	To promote the creation of sustainable school-based health centers.	A case report on Interact for Health, a private foundation.	School-based health centers with the use of NPs that provide vital health services to students in the school system can be self-sustainable if stakeholders are involved and informed.	Only focused on two States’ experiences with NPs in school-based clinics.	Provides an excellent example of how NPs can positively affect the health of school children.	6	NPs working in school systems can positively affect the health of children that typically fall behind in receiving well-child health exams. When school-based health clinics are linked to Federally funded agencies and stakeholders, Medicaid reimbursement can assist in sustaining such programs in school systems.

The advantage of literature reviews for evidence-based practice. Cowell, J.M. (2015)							
There is a lack of literature reviews for evidence-based practice in school nursing.	To promote more investigative studies in school nursing that can be included in literature reviews to establish evidence-based practice	An editorial by an executive editor for the Journal of School Nursing.	More school nurses need to document and write about issues and concerns in the school system	An editorial that could be construed as one persons opinion. No real data was presented.	Dr. Cowell mentions some very convincing resources such as the U.S. Preventive Services Task Force and the 2014 report to Congress.	6	Although the article is low on the level of evidence and it does not mention FNPs in the school environment, it does provide resources to support such a position.